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FLOOD INSURANCE STUDY

VILLAGE OF PORT JEFFERSON, OHIO

SHELBY COUNTY

SEPTEMBER 2, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER 390506

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY

VILLAGE OF PORT JEFFERSON,
SHELBY COUNTY,
OHIO

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Port Jefferson, Shelby County, Ohio, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

This Flood Insurance Study was prepared by compiling existing hydrologic and hydraulic technical and scientific data prepared by the Federal Emergency Management Agency (FEMA) for purposes of the National Flood Insurance Program. The data were identified as the best available at the time of compilation of this Flood Insurance Study and should depict the general conditions of the flooding sources with relative accuracy. FEMA performed a cursory review and accepted the data as valid for purposes of this Flood Insurance Study and the National Flood Insurance Program. However, if better information is known to exist or has been developed since the date of this report, the information should be immediately forwarded to the Natural and Technological Hazards Division, FEMA, Chicago, Illinois, for consideration for revision of this study.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were obtained from the Flood Insurance Study for Shelby County, Ohio (Reference 1).

1.3 Coordination

On October 5, 1987, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the community and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Port Jefferson, Shelby County, Ohio. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected based on the extent and validity of available existing hydrologic and hydraulic data.

Flooding caused by overflow of the Great Miami River in the community was studied in detail.

2.2 Community Description

The Village of Port Jefferson is located in west-central Ohio, 90 miles north of the City of Cincinnati and 65 miles northwest of the City of Columbus, and is surrounded by the unincorporated areas of Shelby County. The village is accessed by State Route 47. The 1980 population of Port Jefferson was reported to be 482, an increase of 16 percent from the 1970 population of 416 (Reference 2).

2.3 Principal Flood Problems

The most recent major flood event on the Great Miami River occurred in 1983. No estimates of the frequency of the 1983 event are available. An island located downstream from the Village of Port Jefferson causes ice jam blockages, which back up the river during severe winters. According to local officials, approximately 35 houses are located within the floodplain. No new development within the floodplain is anticipated.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any

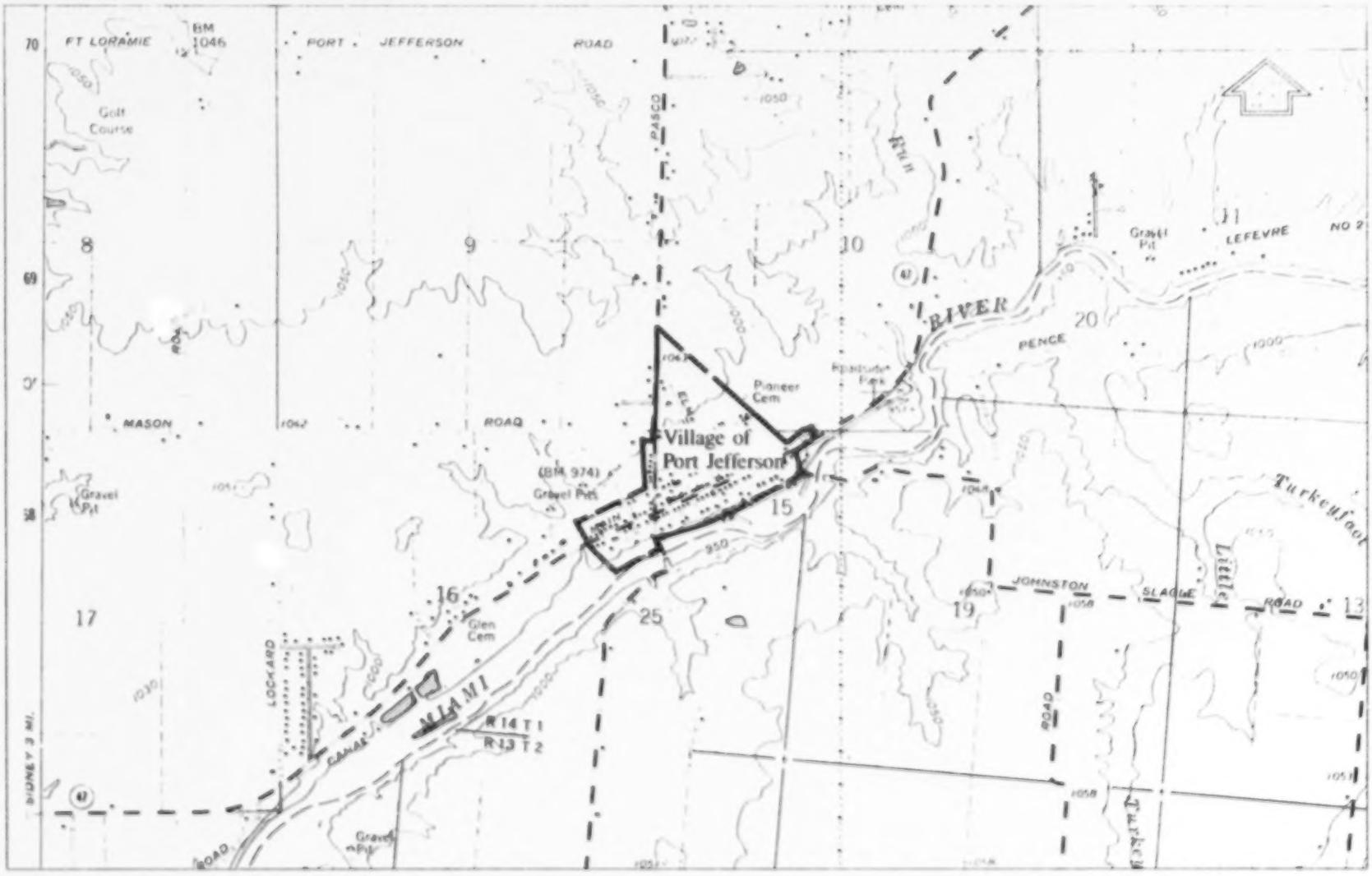


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF PORT JEFFERSON, OH

(SHELBY CO.)

APPROXIMATE SCALE

2000 0 2000 4000 6000 FEET

VICINITY MAP

50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

An in-depth study of all Ohio U.S. Geological Survey gaging stations within the Louisville District was made in accordance with the Water Resources Council Bulletin No. 17A (Reference 3) using the log-Pearson Type III method. In order to enhance any relationships developed, natural flows were reconstructed whenever possible. Determination of final discharge frequency curves considered omission of low and high outliers, weighting with the general skew, and historically adjusting the curves where possible.

Increasing urbanization within a watershed affects the rainfall-runoff characteristics and tends to increase flood discharges, in comparison to watersheds where urbanization has not occurred. In addition, the location of the urbanized area within the watershed affects the amount of increase in flood discharges. Other watershed characteristics used in this study were channel slope and watershed drainage area.

Peak discharge-drainage area relationships for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
GREAT MIAMI RIVER at the corporate limits of the City of Sidney	541.0	14,200	22,700	27,000	38,800

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross-section data for the Great Miami River were obtained from topographic maps (Reference 4) and detail cross sections were modified by aerial photography (Reference 5). The below-water sections were obtained by actual field measurements. All bridges and culverts were surveyed to

obtain pertinent elevation and structural geometry. Detailed structure plans were obtained whenever possible to document details.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map.

Roughness coefficients (Manning's "n") were determined by engineering judgment and field inspection. Where available, historical profiles were used to refine these estimated values. The ranges of roughness coefficients used for the Great Miami River were 0.045 to 0.070 for the overbanks and 0.035 to 0.050 for the channel.

Water-surface elevations of floods of the selected recurrence intervals for the Great Miami River were computed through the use of the HEC-2 computer program (Reference 6). Starting water-surface elevations were determined by the slope-area method.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the map and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 10 feet (Reference 4).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE) and the 500-year floodplain boundary

corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces the flood-carrying capacity, increases the flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections and are shown in Table 2, Floodway Data. The computed floodways are shown on the Flood Insurance Rate Map. In cases where the floodway and the 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway for the Great Miami River lie outside the corporate limits.

The area between the floodway and the 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
GREAT MIAMI RIVER								
A	132.38	417	5168	4.6	956.6	956.6	957.4	0.8
B	132.60	438	5436	4.4	957.2	957.2	958.0	0.8

[1]MILES ABOVE MOUTH
[2]THIS WIDTH EXTENDS BEYOND CORPORATE LIMITS

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF PORT JEFFERSON, OH
(SHELBY CO.)

FLOODWAY DATA

GREAT MIAMI RIVER

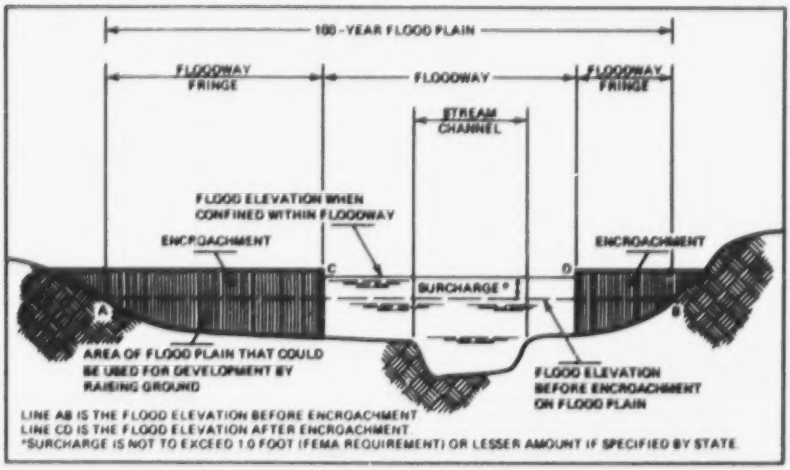

100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE *
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 2 - Floodway Schematic

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

A Flood Insurance Study has been published for Shelby County (Reference 1) and is in agreement with this study.

Due to its more detailed analysis, this Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the Village of Port Jefferson, Ohio (Reference 7).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 300 South Wacker Drive, Chicago, Illinois 60606.

9.0 REFERENCES AND BIBLIOGRAPHY

1. Federal Emergency Management Agency. Flood Insurance Study, Shelby County, Unincorporated Areas, Ohio, March 1982.

2. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Ohio, Washington, D.C., February 1982.

3. U.S. Water Resources Council, Bulletin No. 17A, Guidelines for Determining Flood Flow Frequencies, June 1977.

4. ————, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 10 Feet: Port Jefferson, Ohio, 1973.

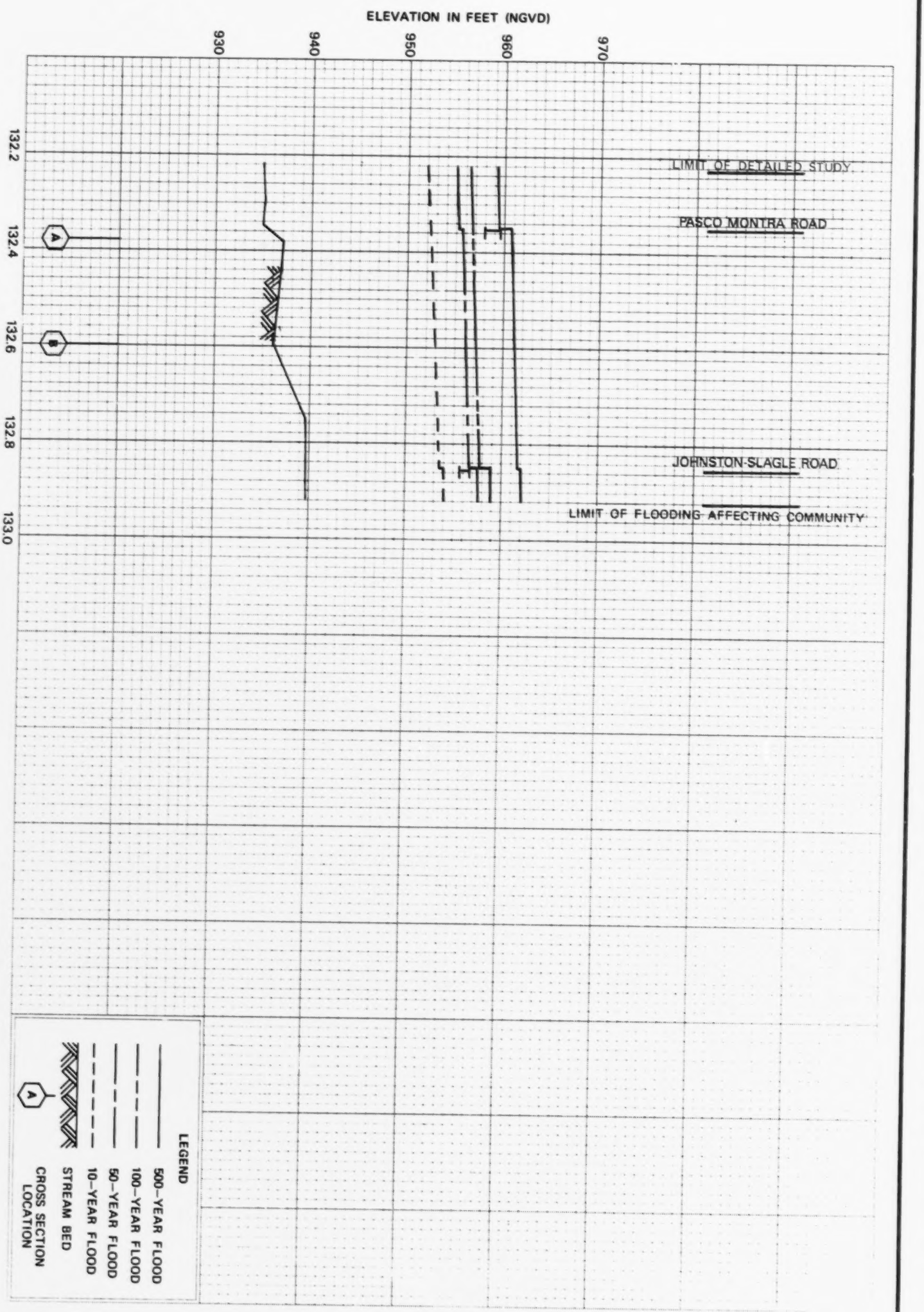
5. Kucheva and Associates Inc., Aerial Photography, Scale 1:6000, Menter, Ohio, December 1979, March 1980 and May 1980.

6. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

7. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Village of Port Jefferson, Shelby County, Ohio, October 1978.

ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1	0001	959.70	a mine spike and plate in power pole located at southeast corner of intersection of State Route 47 and Johnson - Slagle Road



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FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF PORT JEFFERSON, OH
(SHELBY CO.)

FLOOD PROFILES

GREAT MIAMI RIVER